



## Department of Biochemical Sciences

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## RESEARCH AREA & EXCELLENCE

### Metabolism of drugs, activity and regulation of drug-metabolizing enzymes and their role in drug interactions and resistance

- Identification of metabolites of drugs and other xenobiotics in animals, parasitic helminths and plants
- Interactions of natural substances/ food supplements with drugs
- Mechanisms of drug resistance in parasitic helminths

### Mission

To get better knowledge of fate of drugs in various organisms and the factors that could affect drug efficacy and safety

## KNOW-HOW & TECHNOLOGIES

### Content of Research

- Drug biotransformation and transport studies in animals, parasitic helminths and plants

- Effect of drugs, dietary supplements, natural compounds and other xenobiotics on expression and activity of drug-metabolizing enzymes
- Pharmacodynamics mechanisms of drug resistance in helminths

### Main Capabilities

#### Drug metabolism studies *in vitro* and/or *in vivo*

- Antiproliferative and toxicity tests using various cultures of immortalized cells
- Tests of hepatotoxicity of drugs and other xenobiotics
- Preparation and incubation of precision-cut liver and intestinal slices
- Isolation and cultivation of primary cultures of hepatocytes
- Preparation of subcellular fractions (animal and human organs, parasites, plants, cell cultures)
- Assays of enzyme expression
- Assays of enzymatic activities
- Identification of metabolites of drugs and other xenobiotics



### Drug resistance studies in helminths

- *In vivo* animal studies
- Isolation of helminths from infected hosts
- *Ex vivo* cultivations of helminths
- Coprological testing

### Fields of Research

Pharmacology | Biochemistry | Analytical chemistry | Parasitology

## EXPECTATIONS & OFFERS

We are open to a wide spectrum of collaboration with academic partners as well as with partners from applied research, industry and agronomy.

## KEY RESEARCH EQUIPMENT

- Accredited vivarium
- Cell and tissue laboratory
- Laboratory for isolation and cultivation of helminths
- Laboratory for molecular biology (electrophoresis, Western blotting, qPCR)
- Analytical devices (spectrophotometers, spectrofluorimeters, HPLC, LC/MS)

## PARTNERSHIPS & COLLABORATIONS

### Main Projects

- 2015–2017 Anthelmintics in plants – uptake, biotransformation and transcriptional response (Czech Science Foundation 15-05325S)
- 2012–2017 Centre of dietary supplements-drug interactions and nutrigenetics (Czech Science Foundation P303/12/G163)
- 2010–2014 Drug-resistance development in helminths – possible mechanisms and defence (Czech Science Foundation P502/10/0217)

## ACHIEVEMENTS

Publications in respected international journals

